

Amendments to the Claims

The following listing of the claims will replace all prior versions and listings of claims in the application.

Listing of the Claims

1. (**currently amended**) A process for isolating nucleic acids comprising the following steps:
 - charging a non-siliceous surface from a given direction with nucleic acids, wherein said non-siliceous surface has a top side and an two opposing waste side sides and wherein said non-siliceous surface has pores that have a diameter of at least 0.2 μ m;
 - immobilizing the nucleic acids on the top one side of the non-siliceous surface in the presence of: ~~an immobilization buffer comprising~~
 - a ~~salt compound~~ selected from the group consisting of: a salt of an alkaline or alkaline earth metal with a mineral acid; a salt of a monobasic, polybasic, or polyfunctional organic acid with an alkaline or alkaline earth metal; a chaotropic trichloroacetate, thiocyanate, perchlorate, or iodide salt; guanidinium hydrochloride; and combinations thereof, wherein said salt is at a concentration of at least 10 mM; and
 - [[a]] an alcohol selected from the group consisting of: a C1-C5 alkanol; a polyvalent C1-C5 alkanol; hydroxyl derivate of a saturated or unsaturated aliphatic or acyclic hydrocarbon; a phenol; and a polyphenol; and a chaotropic agent;
 - wherein the nucleic acids are immobilized on the top side of said non-siliceous surface in the absence of a cationic detergent;
 - releasing the immobilized nucleic acids from the non-siliceous surface by applying to the non-siliceous surface an elution agent, wherein said elution agent is water or an aqueous salt solution; and
 - removing the released nucleic acids from the same top side of the non-siliceous surface on which the nucleic acids were immobilized,

wherein the released nucleic acids are removed without retrieving materials that have

~~contacted the waste side of said non-siliceous surface do not penetrate to or make contact with the other opposing side of the non-siliceous surface on which the nucleic acids were not immobilized, and with the proviso that the released nucleic acids do not contact any solution that has contacted the opposing side of the non-siliceous surface on which the nucleic acids were not immobilized.~~

2. (canceled)

3. (previously presented) The process according to claim 1, wherein, between the immobilization and release steps, a washing of the immobilized nucleic acids with at least one washing buffer takes place.

4. (currently amended) The process according to claim 3, wherein the washing includes the following steps for each washing buffer:

- transferring a predetermined amount of washing buffer to the non-siliceous surface, and
- drawing the washing buffer through the non-siliceous surface by suction or centrifugation.

5. (currently amended) The process according to claim 1 further comprising the following steps:

- mixing of the nucleic acids with said salt and said alcohol ~~an immobilization buffer~~;
- charging of the nucleic acids mixed with said salt and said alcohol ~~with the immobilization buffer~~ on to the non-siliceous surface;
- drawing the fluid components of the mixture through the surface.

6. (withdrawn) The process according to any of claims 1, 2 or 4, wherein at least one of the steps is carried out completely automatically by means of an automatic machine.

7. (withdrawn) The process according to claim 6, wherein all the steps in the process are carried out by an automatic machine in a controlled sequence.
8. (withdrawn) The process according to claim 6, wherein multiple isolations of nucleic acids are carried out simultaneously using a multiplicity of surfaces.
9. (previously presented) The process according to claim 1, characterized by the fact that between the release and the removal steps at least one chemical reaction is carried out on the nucleic acids.
10. **(currently amended)** The process according to claim 5, wherein said salt ~~immobilization buffer~~ includes aqueous solutions of salts of alkaline and alkaline earth metals with mineral acids.
11. **(currently amended)** The process according to claim 10, wherein said salt ~~immobilization buffer~~ includes alkaline or alkaline earth halogenides or sulfates.
12. **(currently amended)** The process according to claim 11, wherein said alkaline or alkaline earth halogenides or sulfates ~~immobilization buffer~~ includes halogenides of sodium or potassium or magnesium sulfate.
13. **(currently amended)** The process according to claim 5, wherein said salt ~~immobilization buffer~~ includes aqueous solutions of salts of monobasic or polybasic or polyfunctional organic acids with alkaline or alkaline earth metals.
14. (previously presented) The process according to claim 13, wherein said aqueous solutions of salts of polyfunctional organic acids with alkaline or alkaline earth metals includes aqueous solutions of salts of sodium, potassium, or magnesium with organic dicarboxylic acids.

15. (original) The process according to claim 14, wherein said organic dicarboxylic acid is oxalic acid, malonic acid, or succinic acid.
16. (previously presented) The process according to claim 13, wherein said aqueous solutions of salts of polyfunctional organic acids with alkaline or alkaline earth metals includes aqueous solutions of salts of sodium or potassium in combination with hydroxycarboxylic or polyhydroxycarboxylic acid.
17. (original) The process according to claim 16, wherein said polyhydroxycarboxylic acid is citric acid.
18. (canceled)
19. (**currently amended**) The process according to claim ~~5~~ 18, wherein said alcohol is a C1-C5 alkanol ~~hydroxyl derivatives are C1-C5 alkanols~~.
20. (**currently amended**) The process according to claim 19, wherein said C1-C5 alkanol is ~~alkanol~~ are selected from the group consisting of methanol, ethanol, n-propanol, isopropanol, tert.-butanol and pentanols.
21. (canceled)
22. (**currently amended**) The process according to claim 5, wherein said alcohol is ~~immobilization buffer includes~~ a phenol or polyphenol.
23. (canceled)
24. (original) The process according to claim 1, wherein the releasing step is carried out using an aqueous salt or buffer solution.

25. (previously presented) The process according to claim 1, wherein the nucleic acids immobilized on the surface are released using water.
26. (**currently amended**) The process according to claim 5, wherein said salt is a chaotropic trichloroacetate, thiocyanate, perchlorate, or iodide salt, or guanidinium hydrochloride ~~immobilization buffer comprises an aqueous solution of a chaotropic agent.~~
27. (**currently amended**) The process according to claim 26, wherein the chaotropic salt agent is selected from the group consisting of ~~trichloroacetates, thiocyanates, perchlorates, iodides,~~ guanidinium hydrochloride[[,]] and guanidinium isothiocyanate, ~~and urea.~~
28. (**currently amended**) The process according to claim 26, wherein said salt ~~immobilization buffer~~ comprises a 0.01-molar to 10-molar aqueous solution of the salt ~~chaotropic agent.~~
29. (**currently amended**) The process according to claim 28, wherein said salt ~~immobilization buffer~~ comprises a 0.1-molar to 7-molar aqueous solution of the salt ~~chaotropic agent.~~
30. (**currently amended**) The process according to claim 29, wherein said salt ~~immobilization buffer~~ comprises a 0.2- molar to 5-molar aqueous solution of the salt ~~chaotropic agent.~~
31. (**currently amended**) The process according to any one of claims 26 and 28 through 30, wherein said salt is selected from the group consisting of ~~immobilization buffer comprises an aqueous solution of~~ sodium perchlorate, guanidinium hydrochloride, guanidinium isothiocyanate, sodium iodide, ~~or~~ and potassium iodide.
32. (original) The process according to claim 1, wherein the surface is a membrane.
33. (original) The process according to claim 32, wherein the membrane is a hydrophobic membrane.

34. (original) The process according to claim 33, wherein the hydrophobic membrane is made of a polymer with polar groups.

35. (original) The process according to claim 32, wherein the membrane is a hydrophilic membrane with a hydrophobized surface.

36. (original) The process according to claim 32, wherein the membrane is composed of a polymeric material selected from the group consisting of nylon, a polysulfone, polyether sulfone, polycarbonate, polyacrylate, acrylic acid copolymer, polyurethane, polyamide, polyvinyl chloride, polyfluorocarbonate, polytetrafluoroethylene, polyvinylidene fluoride, polyvinylidene difluoride, polyethylene tetrafluoroethylene copolymerisate, polyethylene chlorotrifluoroethylene copolymerisate, and polyphenylene sulfide.

37. (**currently amended**) The process according to claim 36, wherein the nylon is membrane ~~consists of~~ hydrophobized nylon.

38. (previously presented) The process according to claim 36, wherein the membrane is coated with a hydrophobic coating agent selected from the group consisting of paraffins, waxes, metallic soaps, quaternary organic compounds, urea derivatives, lipid-modified melamine resins, organic zinc compounds, and glutaric dialdehyde.

39. (original) The process according to claim 32, wherein the membrane is a hydrophilic or hydrophilized membrane.

40. (original) The process according to claim 39, wherein the membrane is composed of hydrophilized nylon, polyether sulfone, polycarbonate, polyacrylate, acrylic acid copolymer, polyurethane, polyamide, polyvinyl chloride, polyfluorocarbonate, polytetrafluoroethylene, polyvinylidene fluoride, polyvinylidene difluoride, polyethylene tetrafluoroethylene copolymerisate, polyethylene chlorotrifluoroethylene copolymerisate, or polyphenylene sulfide.

41. (canceled)

42. (canceled)

43. (canceled)

Claims 44-50 (canceled)

51. (currently amended) A process for isolating nucleic acids comprising:

(1) immobilizing nucleic acids on one a top side of a membrane, said membrane defining a top side and a waste side thereof and having pores of a diameter of at least 0.2 μ m, said immobilizing step taking place in the presence of:

a salt ~~an immobilization buffer comprising a compound~~ selected from the group consisting of: a salt of an alkaline or alkaline earth metal with a mineral acid; a salt of a monobasic, polybasic, or polyfunctional organic acid with an alkaline or alkaline earth metal; a chaotropic trichloroacetate, thiocyanate, perchlorate, or iodide salt; a guanidinium hydrochloride salt; and combinations thereof, wherein said salt is at a concentration of at least 10 mM; and

an alcohol selected from the group consisting of a C1-C5 alkanol; a polyvalent C1-C5 alkanol; ~~a hydroxyl derivate of a saturated or unsaturated aliphatic or acyclic hydrocarbon~~; a phenol; and a polyphenol; and ~~a chaotropic agent~~,
wherein the nucleic acids are immobilized on the top side of said membrane in the absence of a cationic detergent;

(2) ~~followed by~~ releasing the immobilized nucleic acids from the membrane by applying to the membrane an elution agent, wherein said elution agent is water or an aqueous salt solution, and

(3) collecting the released nucleic acids from the same top side of the membrane on which the nucleic acids were immobilized;
wherein the nucleic acids are collected without retrieving materials that have contacted the waste side of said membrane ~~do not penetrate or contact the other side of the membrane;~~

wherein the membrane comprises a material selected from the group consisting of nylon, polysulfone, polyether sulfone, polycarbonate, polyacrylate, acrylic acid copolymer, polyurethane, polyamide, polyvinyl chloride, polyfluorocarbonate, polytetrafluoroethylene, polyvinylidene fluoride, polyvinylidene difluoride, polyethylene tetrafluoroethylene copolymerisate, polyethylene chlorodifluoroethylene copolymerisate, and polyphenylene sulfide; and wherein the membrane material is hydrophilic, hydrophobic, hydrophilized, or hydrophobized; ~~with the proviso that the released nucleic acids do not contact any solution that has contacted the other side of the membrane on which the nucleic acids were not immobilized.~~

52. (canceled)

53. (previously presented) The process according to claim 51, wherein the membrane is a hydrophobized nylon membrane.

54. (previously presented) The process according to claim 51, wherein the membrane is a hydrophilic membrane, which is coated with a hydrophobic coating agent selected from the group consisting of paraffins, waxes, metallic soaps, quaternary organic compounds, urea derivatives, lipid-modified melamine resins, organic zinc compounds, and glutaric dialdehyde.

55. (previously presented) The process according to claim 51, wherein said process for isolating nucleic acids is carried out in a plurality of isolation devices installed on a multi-well plate.

56. (withdrawn) An apparatus adapted to the automatic performance of a process according to any one of claims 1 through 49.

57. (withdrawn) The apparatus of claim 56, comprising at least one vacuum apparatus suitable for automatically carrying out the application of buffers and solutions to a surface in an isolation device and automatically removing buffers and solutions away from the surface.

58. (canceled)

59. **(currently amended)** The process according to claim 3, wherein the washing step is carried out using **[[a]]** an aqueous solution of a salt of an alkaline or alkaline earth metal with a mineral acid.

60. **(currently amended)** The process according to claim 3, wherein the washing step is carried out using **[[a]]** an aqueous solution of a salt from a monobasic, polybasic, or polyfunctional organic acid with an alkaline or alkaline earth metal.

61. (previously presented) The process according to claim 3, wherein the washing step is carried out using an aqueous solution of a chaotropic agent.

62. (previously presented) The process according to claim 3, wherein the washing step is carried out using a C1-C5 alkanol ~~hydroxyl derivative of an aliphatic or acyclic saturated or unsaturated hydrocarbon.~~

63. (previously presented) The process according to claim 3, wherein the washing step is carried out using a phenol or a polyphenol.

64. (previously presented) The process according to claim 38 or claim 54, wherein said metallic soaps are in admixture with aluminum or zirconium salts.

65. (not entered)

66. (not entered)

Claims 67-68 **(canceled)**

69. **(currently amended)** The process according to claim 51, further comprising the steps of:

- mixing the nucleic acids with said salt and said alcohol ~~an immobilization~~

buffer,

- charging the nucleic acids mixed with said salt and said alcohol ~~with the immobilization buffer~~ onto the membrane,
- optionally, washing the nucleic acids immobilized on the membrane,
- drawing the unbound fluid components of the mixture ~~immobilization buffer~~ or wash buffer through the membrane.

70. **(currently amended)** The process according to claim 69, wherein said salt ~~immobilization buffer~~ includes aqueous solutions of salts of alkaline and alkaline earth metals with mineral acids.

71. **(currently amended)** The process according to claim 69, wherein said salt ~~immobilization buffer~~ includes aqueous solutions of salts of monobasic or polybasic or polyfunctional organic acids with alkaline or alkaline earth metals.

72. **(currently amended)** The process according to claim 69, wherein said alcohol is a C1-C5 alkanol ~~immobilization buffer includes hydroxyl derivatives of aliphatic or alicyclic saturated or unsaturated hydrocarbons.~~

73. **(currently amended)** The process according to claim 69, wherein said alcohol is ~~immobilization buffer includes~~ a phenol or polyphenol.

74. **(currently amended)** The process according to claim 51 or claim 69, wherein said salt is a chaotropic trichloroacetate, thiocyanate, perchlorate, or iodide salt; or guanidinium hydrochloride ~~a chaotropic agent is used for the immobilization of the nucleic acids.~~

75. **(canceled)**

76. (new) The process according to claim 51 or claim 69, wherein said C1-C5 alkanol is selected from the group consisting of methanol, ethanol, n-propanol, isopropanol, tert.-butanol, and pentanols.